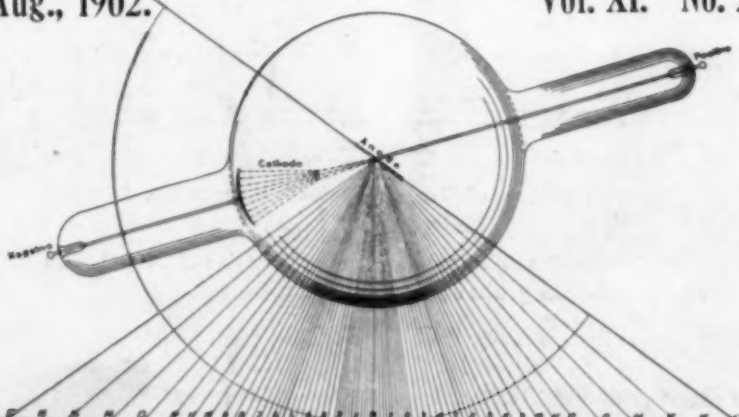
SIXTH YEAR.

Aug., 1902. Vol. XI. No. 2.



AMERICAN X RAY JOURNAL

St. Louis, Mo. and Chicago, Ills., U. S. A.

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THE AMERICAN X-RAY JOURNAL

PUBLISHED MONTHLY BY THE AMERICAN X-RAY PUBLISHING COMPANY

Editor. T. PROCTOR HALL, Ph. D., M. D.
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CHICAGO, ILL.

THE AMERICAN
X-RAY JOURNAL.

Devoted to Practical X-Ray Work and Allied Arts and Sciences.

VOL. XI. *ST. LOUIS AND CHICAGO, AUGUST, 1902.* *No. 2.*

Publishers' Announcement.

The American X-Ray Journal will devote its columns to the education of the medical profession in X-Ray and Electro-Therapeutical Practice.

This includes (a) X-Ray Diagnosis, both medical and surgical, the methods of fluoroscopic and photographic examination, of locating fractures and dislocations, renal and hepatic calculi, aneurisms, abnormal conditions of the heart, tumors, tubercular diseases, malformations, etc.

(b) X-Ray Therapy, treatment of cancer, tuberculosis, diseases of the skin, etc., etc.

(c) Electrotherapy of acute and chronic diseases as follows: Mental and nervous; diseases of the heart, lungs, eye, ear, nose and throat; gynecology, obstetrics, genito-urinary diseases, diseases of children; skin, liver, kidney, rectal and intestinal disorders; by such methods and apparatus as should be at the command of every practicing physician and surgeon.

(d) Dental diagnosis and treatment.

X-Ray and Electro-Physics, insofar as they directly concern the physician and surgeon; new forms of apparatus and investigations into the nature of the forces used; will receive their full share of attention.

As far as practicable each number of the Journal will contain articles in each of the following departments:

1. Scientific and original articles for advanced workers.

2. Clinical reports of x-ray therapy and electro-therapy. Every physician, no matter what school he belongs to, is invited to send for publication reports of his cases treated with the x-ray or electricity, not exceeding two hundred words. State exactly what you did, how you did it, and the results, and the Journal will be glad to give you the space.

3. Editorial News and Notes, giving the latest news in x-ray and electro-therapeutics from all parts of the world. Translations from foreign journals will be made by the members of our own editoral staff.

4. Queries answered by well known specialists.

5. X-Ray and Electro-Therapeutical Practice; papers by the leading specialists both here and abroad.

6. Lessons for Beginners, a complete course, consisting of 24 lessons, under the auspices of The Chicago College of X-Ray and Electro-Therapeutics, on the principles and practice of x-ray and electro-therapeutics. No physician can afford to miss this course. It is worth $100 to any practitioner.

We will expose fraud and charlatanism wherever we find it, and will exercise the utmost care to see that everything that enters the pages of the Journal is thoroly reliable. Truth is what we seek and truth we welcome from every source, giving credit where credit is due, without fear or favor.

The Journal will be enlarged as rapidly as necessary to meet all requirements. The subscription price will remain the same as heretofore; $3.00 per year in the United States, Canada and Mexico; $4.00 in foreign countries. Single copies 50 cents.

Practical X-Ray Diagnosis.

Prepared by J. Rudis-Jicinsky, A. M., M. D., M. E. Cedar Rapids, Ia. Revised by M. U. Dr. Joseph Hoffman, Vienna, Austria.

A series of A B C teaching for workers in x-ray diagnosis and therapeutics, to be concluded in 20 lessons. Fully illustrated.

Fluoroscopy.

LESSON X.

The property of the Roentgen rays of producing an intense light on a screen covered with fluorescent matter is the basis of fluoroscopy. If bodies which are opaque to the x-rays, such as the bones of the human body, are placed before the screen, their contours may be seen with surprising distinctness, and not only the shadows but the substance of the bones may be studied satisfactorily. Cartilage, which is practically transparent to the rays, gives us a marked line on the shaft of the bone, and the presence of any earthy salts in the cartilage enables us to detect the very early beginning of ossification, before the knife and the naked eye can detect them with all the data put down in our standard text-books.

The best screens are those prepared with barium platino-cyanid. The cyanid has to be crystalized and re-crystalized before the cardboard is coated. Afterward a protecting varnish must be applied and material of very fine grain used. Screens so prepared are not only more brilliant, but having finer crystals show small details of the fluoroscopic image to better advantage than calcium tungstate screens. Every exhausted tube can be used for screen work, but thick parts of the human body can only be observed with first rate vacuum tubes excited by a powerful induction coil or a good static machine. In cases where it is impossible to completely darken the room or where we are after the minute details of our image, not a screen but a fluoroscope must be used.

The fluoroscope designed by Edison consists of a flaring box, curved at one end to fit over the forehead and eyes like a stereoscope. The end of the box is closed by a pasteboard cover in a frame, removable or not, on the inside of which is spread a layer of tungstate of calcium, or of barium platino-cyanid. (Fig. 1.) By placing the object to be observed, such as the hand, between the vacuum tube and the fluorescent screen of the fluoroscope, the shadow is formed on the latter and can be observed at leisure. With proper understanding of the nature of these shadows cast upon the fluoroscopic screen or the photographic plate, it soon becomes easy with experience and a little practice of the operator, to take in the pictures at a glance. To make a correct diagnosis, we have to remember that we are dealing with shadows, and require more than one point of view to judge properly. A shadow has but two dimensions and a second shadow at right angles to the first becomes necessary to give us the three dimensions. When the proper conditions are known the x-ray cannot deceive, its revelations are infallible. Just study a little the shadows of your hand on the wall and light in front and get aquainted with the fundamental laws of physics in this case, remembering that the pathologist cannot interpret his microscopical findings if he does not know his normal histology. So with the

fluoroscopy, the skiagrapher has to know and must have before him the normal skiagraph before he can make his diagnosis and interpret properly the abnormal conditions.

In making an examination the observer should increase his sensibility to the light by remaining some minutes in the dark before using the fluoroscope. The part to be observed should be placed before the fluoroscope, as near as possible, until the picture of the bones is quite distinctly seen. And let us state right here that the bones are the best guides in fluoroscopy for differentation in examination of different qualities of the rays. When the room can be darkened an open fluorescent screen may be used, large enough to enable one to observe the chest. The beating of the heart, movement of the diaphragm, etc., may be seen with surprising distinctness. In observing the chest use a tungstate of calcium fluoroscope first, and take care that the patient should not be placed too near the tube, lest the heart appear enlarged upon the screen. When it is required to render the rays from the tube invisible, cover the tube with a black cloth. In many cases, such as when search is made for a foreign body, photography is better than observation by the screen. For examining the beating of the heart, etc., on the contrary, the screen is to be preferred, especially a flexible screen with which we obtain equality of definition and intensification in our image.

The changes in the form of the heart, for instance, as we notice them thru the fluorescent screen, are quite similar to those which we have on the corresponding skiagraphs, yet there is a slight difference that we are able to observe the immediate effect of any deviation or abnormality, while during the taking of a picture certain delay must needs take place. The screen certainly permits more than one person to observe the x-ray picture at the same time in a darkened room. Screens are flexible or mounted in wooden frames, if we wish too with protecting glass over the film, and can be either stood upon the table or suspended before the tube. In making observations with the screen, take care not to place the patient too near the screen or electrical connections, to avoid the danger of receiving shocks from apparatus. A distance of two or four inches suffices for avoiding this. The more the room is darkened, the better the picture will appear on the screen. It is also necessary to first accustom the eye to the darkness, as stated already.

All workers in Roentgen photography have experienced failures more or less. Apart from such causes as mistakes in the arrangements of the apparatus, or inefficiency of the same, cases occur in which no reason can be assigned for the failure other than the inefficiency of the x-ray tube. Judging the efficiency of a tube is, however, by the methods hitherto described, a venturesome matter sometimes. The manner of testing was by placing the hand against the fluorescent screen beneath a fluoroscope or in a dark room, and being satisfied with the tube on seeing the bones of the hand with distinctness. But, as the hand is a very thin object, this effect is secured by tubes of very medium efficiency. If by the introduction of more current the efficiency of the tube be increased, the picture of the hand upon the screen would not improve, because the rays would now penetrate bones. For this reason something different from the hand must be chosen for an object test. Such an instrument is the skiameter; a fluoroscope to which a system of tinfoil tablets, together with a

numerical scale is applied against the fluorescent screen. The screen is divided into squares, with numbers of lead, which appear dark. Each individual square is furnished with an increasing number of tinfoil leaves or tablets. The field No. 1 is kept clear, No. 16 has a layer of 15 tinfoil leaves, which have a combined thickness of 0.65 millimeters. As the distance of the screen from the tube is an essential factor a funel-shaped tube is placed upon the former against the aperature of the skiameter. In my laboratory I have used for testing the tube a simple frame of tinfoil squares around a large empty square for observation, comparation and differentiation of different shadows, which appear upon the screen of a common fluoroscope. The frame is laid against the end of the box, closed by a paste-board cover, and observation and the differentiation may be made with the examination proper. The tinfoil leaves may be pasted on a cardboard frame with a large square opening in the middle. In this middle opening we have our image examined, which easily may be compared with the shadows of the small squares of tinfoil around, marked with small holes, one, two, etc., according to the thickness of the tinfoil layers. If, in photographic exposures the distance of the platinum reflector in the tube and the efficiency of the tube according to the number shown on our frame or in the skiameter be carefully noted, one will, under like conditions for the same object or bodies, obtain like results. In our laboratory we obtained a picture of the buttocks of a very strong lady by a tube by which the number 12 in our frame or skiameter was distinguishable, in three minutes. The distance of the platinum in the tube from our dry plate measured 80 centimeters. The experiment was made with a static machine, ten plates, with a dry plate coated on both sides and placed between two intensifying screens. Beneath the patient lay a leaden box constructed for this purpose, and in the casket a layer of lead about half an inch in thickness was placed under the plate. The experiment was a success.

How to take a Skiagraph.

LESSON XI.

In describing a method of taking an x-ray picture, radiograph or skiagraph with the Crookes tube working at its best, it makes no difference whether a 1-inch or a 20-inch induction coil, static machine or another apparatus is used for generating the x-rays in the tube, the method of operation is in every instance the same and without a camera. A simple object, metallic or any other, is taken in the same manner as the chest of a man; it is only a question of degree of the penetration.

For the beginner in x-ray diagnosis it is always good to select for the first exposure an object which is easily taken, and gives a good opportunity to study the different layers of the muscles, ligaments, bones, the internal structure of the same, cartilages, and their relations in the living body. Such a subject is the human hand, which gives different shadows for comparison and may be skiagraphed in a few seconds. For simplicity of description we will suppose that we are now ready to proceed. We take our casket containing a dry plate, say Cramer's, made expressly for x-ray work, whose film side is turned upward. The plate must be put into the casket in the dark room, or we may insert it into two envelopes furnished by the manufactures. This procedure must be done very carefully. The envelopes have the advantage of bringing the objects exposed

a little closer to the dry plate. The hand is laid in the desired position, the side to be observed more fully as near as possible on the plateholder or over the envelopes, and fixed immovable (with adhesive plasters, if necessary). If we would like to have a picture of the internal structure of the bones also, we enclose an intensifying screen of very fine grain in the envelope against the film of the dry plate. That has to be done in a dark room, too. Our Crookes tube being about 12 inches or more from the plate is put with all our apparatus into operation, presuming that our machinery is in good order, and all electrical connections properly made. The tube must be in position over our object and the disk of the anode so situated that the exposure takes place under the most beautiful radiation of the green field seen on the glass walls of the tube when excited. After a certain time of exposure, guided by previous experience and fluoroscopic examinations, the apparatus is stopped at once, the coil by the switch, the static by a metallic rod laid over the primary conductors, negative and positive, and the exposed plate carried into the dark room for development. As you see, the modus operandi is very simple, and as stated above always the same, but practice and experience are necessary just as well as in other methods of diagnosis.

We have to have in mind that each particle at the moment of bombardment in our Crookes tube become a source of x-rays, and that the more particles we have in action the greater will be the quantity of rays. If we vary the intensity of bombardment per particle in the x-ray tube we get different degrees of rays or, as we can put it, certain variation in the range of the ultra-violet rays or change in the wave-length and vibrations per second, giving us rays varying from those with great differentiation and very little penetration to very little differentiation and great penetration. Therefore the greater the intensity of our current and the more particles in action in our tube the greater and better the quantity of our rays. To have good contrast on our photographic plates or on our fluoroscopic screen, in making a skiagraph of certain part of the body or in observing the same, we must have a certain intensity of bombardment per particle in our tube, and to get short exposure we must have a great quantity of rays, the former the result of our current and the latter that of the number of particles in action.

In making an exposure for a picture the further away we place the tube from the plate and the closer we place the object to be skiagraphed to the photograpic plate the better definition and contrast in the negative we will get. If the tube is held close to the part exposed, or if the part exposed is held away from the dry-plate, the resulting negative will be magnified and distorted. But we have to remember that each individual case requires special attention, and that the distance between the tube and the dry-plate principally depends upon the thickness of the body or object to be photographed. A distance approximately taken in a person weighing 150 pounds would be as follows:

Hand and wrist, duration of exposure, 30 seconds, at the distance of six inches from the plate; 45 seconds suffices for photographing the forearm at the distance of 6 inches. The arm above the elbow will be taken at the exposure of one minute at the distance of 10 inches; shoulder, one minute at 18 inches; thorax, 3½ minutes at 20 inches; hip-joint, 5 minutes at 22 inches; knee, 3 minutes at 13 inches; foot, 2 minutes at 14 inches, etc., without the intensifying

screens. The greater the distance, the longer is the necessary time of exposure. In photographing chest and bosom, corpulence and age of the respective persons, as stated above, should be taken into consideration. For reducing the time of exposure still more to seconds instead of minutes, intensifying screens are used, to which we shall again refer. Using the above distances please do not consider them as a pattern, but take care of your case and you never will produce any irritation or dermatitis, and your exposures will be sufficient to give satisfactory results. A long exposure should never be made with a low vacuum tube. It should not exceed 30 minutes and the distance must be proper.

In my experience I have worked one and the same tube for certain delicate fluoroscopic and photographic work at its highest state of efficacy, when the platinum reflector in the tube was red, and sometimes at white heat, watching for the vacuum not to be unduly lowered and found out that the quality of the rays varied with the resistance of the tube. In directing the tube to the object take care that the platinum reflector is held parallel to and centrally over the dry plate, see that the machinery is in order, the electrical connections properly made, and the wires leading from the coil to the static do not touch the glass walls of the tube, for fear of the perforation of the tube by the electrical discharge. It will be found very handy to seal the eyes or loops of conductors outside of the tube with common lead fuse wire, staniol, or oil silk, to prevent leaking. The wires leading from the secondary terminals of the induction coil or the static machine to the Crookes tube should be well insulated and covered with rubber tubing. By these and other manipulations the best x-ray produceable by a given tube and a given apparatus may be made quickly available and the penetrative force regulated; but we have to have always in mind that the length of exposure depends not so much on the time during which the tube is in action, but upon the actual time of best x-ray production. And in this green x-ray field, tested occasionally by means of the fluoroscope, we have to work—and sometimes accomplish most beautiful results.

Always know your technique, your apparatus, your Crookes tube and its quality, the power of your x-ray, the distance of the tube from your object, the distance from the photographic plate, which must be as near as possible to the part examined, remembering that the shadows which are seen most beautifully correspond exactly with the radiation from the disk of the platinum in the tube; know and regulate the duration of exposure; and mark the angle at which the picture is taken. If you wish to make a correct diagnosis and produce an accurate skiagraph, you must never be satisfied with one picture of the case, but make it also your duty to produce different skiagraphs from different points, taking at least two skiagraphs perpendicular to each other with the help of the fluorometer, comparing the same, and the injured part with the normal one. Our work must be rapid, exposures short, and the patient, if necessary, protected with few layers of staniol on parts not examined, or an aluminum screen interposed between the tube and the patient, and grounded as advised by Tesla. This is done especially in prolonged or repeated examinations, but should not preclude the taking of other precautions. To read correctly the lesson of an x-ray picture, know your individual case, your anatomy and pathology; keep the obliqueness of the x-rays in mind, and make the skiagraphs as nearly life-size

as possible to get sharply defined outlines, using a proper intensifying screen of fine grain if necessary, and a fluorometer or a dividing screen for measurements and exactness of your negatives, which have to be marked properly with your name, made in wire and laid on the plate before exposure, and all necessary data for identification and record. In the corner of each picture, make it a rule to mark the power of the spark used, say, "Spark 12 inches;" the distance of the tube from our object, "tube 8 inches;" the distance from the sensitive plate, "plate 12 inches;" film or paper; duration of exposure, "exposure 10 seconds;" the angle at which the picture is taken, "36 deg.," etc., or simply: "S 12, T 8, P 12, E 10 seconds, 36 deg." All these letters and numbers are made in wire and laid on the plate before the exposure. And if we mark also the right and left side of the object taken, with "R" and "L" there hardly can be a possibility of any deviation, especially when the fluorometer is used to correct any distortions with mathematical accuracy. Then you will make sometimes skiagraphs which really will be most wonderful, will secure you the best consultants, will protect you for the future and show you what to do in the proper way.

Static X-Ray Generators.

By Dr. John T. Pitkin.

The fluoroscope through which I invite you to look is nearly new, hence a suitable medium for the investigation of the quantity, quality and general properties of the Roentgen rays.

Time and use cause a fluoroscopic screen to become dingy, dim, of a darker shade of color, and to fluoresce imperfectly under the x-ray stimulus, calling for renewal semi-annually.

This fluoroscope is of the conventional form with removable platino-cyanid of barium screen 6x8 inches in measurement.

The Crookes tube to be excited is of a medium size, German type, having, when cold, a resistance equal to a 3-inch air gap between discharging rods of a static machine tipped with balls 1½ inch in diameter in a July atmosphere.

In order that the look may be worthy of your valuable time, I will excite the tube with the current from a static machine having twenty-four revolving dics and another machine having twenty-two revolvers; the two generators will be operated in multiple relation to each other, i. e., forty-six wheels will work harmoniously in the generation of the lightning current.

The same laws that govern the wiring of batteries or connecting dynamos in the multiple relation to each other to increase the volume or amperage of the the current are applicable to high potential apparatus.

Some three years ago in the columns of this valuable Journal the writer described how we were then operating a twelve and an eight revolving plate Waite and Bartlett static machine for their combined action upon the Crookes tube.

This we accomplished by attaching an extra pair of prime conductors to the posterior surface of one instrument. These structures were electrically connected to the anterior prime conductors of the other generator.

Each machine was operated by a separate motor. A more simple method now employed consists in placing two machines side by side, their neighboring prime conductors are charged negatively and connected to each other by a short brass chain. The more remote

prime conductors are given a positive charge and electrically connected to a long brass chain suspended high in the air from the arms of the standards usually employed in the treatment of patients by static electricity.

To avoid the electrical charging of the apartment, its inmates, etc., and prevent unnecessary loss or modification of the current the standards used as poles are placed upon insulated platforms.

Both static generators are operated by a single shunt wound motor having a pully with two deep grooves.

Under varying loads resulting from resisting tube, spark gaps, condensers, etc., a shunt wound motor has a more constant speed than motors of the series wound variety. Shunt winding calls for an extra rheostat in the armature circuit.

Deep grooves in the pulleys lessen the tendency of the belts to fly off when the apparatus is run at a high rate of speed. If the grooves in your pulleys are shallow you can deepen them by holding, with pressure, a round file of suitable size in grooves while apparatus is running.

The subject of dynamos, motors and dynamotors has been fully considered in a previous article published in this Journal. The reader will observe that the methods just described of connecting together static machines for their combined action are equally useful for the charging of one machine from another. Owing to the abundance of x-rays placed at our disposal by the fortunate combination we are afforded an excellent opportunity to study the x-ray field of energy, and by exploring the same observe their rectilinear and diverging course from the target into space; take notice of their varying quantities and qualities as modified by the following conditions:

(1) Distance from point of emission. (2) Speed and number of plates of generator. (3) Presence or absence of spark gaps, various size, number, position, length and manner of construction. (4) The presence of condensors, their size, number and method of discharge. (5) Varying resistance of the Crookes tube, resulting from changes in the degree of its exhaustion. (6) More than one tube in the circuit.

All of the conditions enumerated modify the generating capacity of the x-ray bulbs, and give information requisite to determine the position of patient, sensitive photographic surface, the shape and construction of the latter, in order that the x-ray pictures of the interior of the human organism may be fully as free from distortion as the delineations of its exterior by the expert photographer.

Buffalo, N. Y.

Electrolysis.

By H. P. FITZPATRICK, M. D., PH. R.

Professor of Dermatology in the Chicago College of X-Ray- and Electro-Therapeutics.

There are so many reasons why an extended article on "Electrolysis" is needed at this time, when, by its prompt and proper application so many facial defects can be removed, that the writer intends to go into the subject with minuteness, (especially as to best methods of treatment), and give in detail the various defects coming daily before the average dermatologist.

By taking it for granted that every physician has some work on dermatology, we can in the commencement eliminate the etiology and diagnosis, and confine this article to modes of treatment.

This will so simplify matters as to insure the taking up of the subject of treatment in extenso and with sufficient precision to preclude the possibility of failure, when ordinary care and a little practical experience are a part of the physician's equipment.

In electrolysis we have a powerful and at the same time comparatively painless form of electric energy. As a hemostatic, as a simple irritant, as a powerful irritant, as a disintegrator of living tissue, as an anesthetic for local purposes, as an antiseptic, and finally, as a decomposer of abnormal growths, malignant or non-malignant, it is, in the writer's opinion, which is formed from extended experience, the remedy par excellence. Take for instance papillomas, moles, verrucae or warty excrescences, xanthomas, cutaneous cornus, medium-sized tumors, or any elevated abnormal tissue formation, and apply electrolysis as per instruction to follow, and you will become as enthusiastic as you are now lukewarm. There is no question but that it is the most appropriate method for their extermination.

In the treatment of enlarged capillaries, such as the enlarged superficial vessels of the nose and cheek, in all forms of acne rosacea, in nevus araneous or spider cancer, in nevus pigmentosus, and all other varieties of so-called birthmarks, there is nothing so certain as electrolysis; and if the operator uses good judgment no other method will leave the skin in such perfect condition.

If eye specialists would only take up electrolysis for the removal of ingrowing eye-lashes they would prevent untold suffering and get good fees from those unfortunately afflicted in this manner. A few drops of 4 per cent. solution of cocaine in the eye and an eye clamp to evert the lid, a fine pointed electrolysis needle, a current of from 1 to 3 milliamperes and in the worst cases not to exceed three hours will be required to restore perfect sight and bring immediate relief to many who were tortured beyond description.

Could electrolysis do no more than this it would be worthy of esteem for ridding the afflicted of these indescribable irritators. In all facial eruptions, acne, acne vulgaris, acne punctata, etc., electrolysis as the antiseptic and soothing agent and corrected diet as the adjunct will be all the treatment required. The electrolytic action being powerfully antiseptic, destroys all micro-organisms, and ungents and corrected diet do the rest.

When growths are benign the removal is a question of no moment, but when they begin to undergo changes such as the breaking down of tissue, redness, inflammation, softening, shooting pains and other evidences of the approach of malignancy, then transfixing the growth with the needle and decomposing the tissue so thoroly as to prevent the possibility of recurrence will be all the treatment necessary.

Curetting, galvano-cautery, pyrogallic acid, are all scarifying. Electrolysis is as certain; scar, nil. Then why not use the method that gives the patient the best cosmetic effect.

From personal observation in numerous instances where growths have returned after having been removed by the knife, one treatment by electrolysis was all that was necessary to destroy them. In these cases the knife leaves some portion of the structure intact to build up a new growth, while electrolysis insidiously insinuates its decomposing elements into every portion of the growth and eliminates it completely. For this work a stronger current is necessary, and it would be advisable to begin with

2 or 3 milliamperes and increase gradually to the point of tolerance. In fibrous tumors it may be necessary to use the more powerful acid current of the positive pole, and if so, use a platinum or irido-platinum needle.

Unless an elaborate outfit is desired an office can be fitted up at very small expense. The first requisite is the battery.

For permanent office use, a 30 to 40 cell McIntosh cabinet battery is the best.

By shifting the current to different cells from time to time, thus resting one set while using another, your battery is always in good condition.

A battery of 30 cells should give all the current desired by a busy dermatologist, and if used carefully should not require recharging oftener than once a year.

A small portable battery of from 6 to 12 cells will suffice, however, and perhaps be best suited for infrequent use

Any needle holder that will make a perfect connection with cord tip and needle will answer.

A pair of fine tipped epilating forceps, two sponge electrodes, two sets of cords, a galvanometer, three flexible steel needles, three platinum or irido-platinum needles, all of which can be bought at your instrument house.

Your needles should all be fine pointed. The bulbous needle will nearly always scar.

When using the positive pole for electrolytic work, use your platinum needle, as the acidity at the positive pole decomposes the steel needle and leaves a black pigmentation in the skin. This can be removed, however, by inserting the negative pole at point of pigmentation. When you do not feel any too sure of your ability to handle the battery it would be advisable to use only platinum or irido-platinum needles.

A northern exposure gives the best light for this work. Have your operating chair placed so that the patient will face the window. For the removal of superfluous hair on chin or cheeks use from 3 to 5 milliamperes. Connect the needle with the negative (zinc) pole of the battery. For the more sensitive parts, viz.: nose, nostrils, upper lip, ears and breast, from 1 to 3 milliamperes. Bear in mind, however, that no fixed amount of electricity can be used on different patients for the same defect. Idiosyncrasies, physical conditions, the texture of the skin, all must enter into your calculations as to how much or how little to use.. A good rule is to begin with the minimum amount and gradually increase to the maximum or to the point of tolerance.

The best way to get an even, continuous current is to use a bowl of water and have the patient make and break the current by placing the fingers in and out as the needle is inserted and withdrawn. A sponge electrode must be frequently resaturated or the water is absorbed and the current becomes too weak to be effectual. The removal of superfluous hairs, requires delicacy of touch, considerable experience, and a natural adaptability for perfect success.

No one is entitled to recognition as an expert in the branch of dermatological work who, after subsidence of inflammation and dessication of the crust formations, leaves permanent cicatricial traces of this operation.

Place your patient in such a position that a strong light will always be on the field selected for your operation. In order to prevent the possibility of scarring the patient select the largest hairs for the first operation and keep the points of vesiculation so distantly separated as to preclude their coalescing. Insert the needle along the hair shaft

until from ⅛ to ¼ of an inch has been inserted into the follicle. By frequent practice you will find that the needle seems to slip into the follicle intuitively.

After connection is made and the electrolytic action is completed withdraw the needle. Now remove the hair and follow the above procedure on each hair until operation is suspended. When traction is required to remove the hair the follicle is not decomposed and the needle must be reinserted and the electrolytic action continued until the hair drops out of the follicle without the least resistance. You will be more likely to retain your patient and secure her friends by slow but sure work than by rapid but poor work. By making up your mind to thoroness even to slowness, you will have an established principle that will remain when your experience brings rapidity and increasing dexterity. A conscientious operator who practices daily will soon become sufficiently proficient to undertake the most delicate of these operations without fear of the results. The writer has in one case destroyed 28,000 hairs without leaving the slightest trace of the operation. If there is any question in the reader's mind as to the accuracy of the count, the fact that the work was paid for by the hair, will I think, dispel it.

For moles, warts and all elevated, abnormal growths transfix the raised tissue with the needle connected as before with the negative pole, and continue inserting at different points until the growth is thoroly decomposed. Then bevel the edges of the growth until the raised tissue is decomposed level with the surrounding skin. In treating raised tissue always insert thru and not down into it. When the growth is reduced to the surface of the skin the crust formation will not scar, but if the needle is inserted into the growth the result of such treatment will be a depression or pit. From 2 to 5 milliamperes, depending upon location, will be sufficient.

It is really surprising how quickly these abhorrent conditions yield to the needle when scientifically applied.

Taking for illustration the very ordinary condition commonly known as "red nose," wherein the formerly invisible capillaries have thru exposure to weather, thru drink, or stomach disorders, become so engorged and stretched, as to attract attention and create comment; an almost miraculous improvement occurs after one treatment by electrolysis.

As the operator desires to drive the blood into the deeper vessels and set up sufficient inflammation in the superficial ones to occlude them, it is best to begin operating at the tip of the nose and carry your work forward toward the base. An exceedingly fine needle is necessary as the nose is quite sensitive. The vessel operated upon will become blanched from the point of insertion of the needle to the extreme point of electrolytic action; therefore, in following up the treatment, reinsert your needle as near the point of furthest electrolytic action as possible, and continue following the vessel in this way until it has disappeared. Unless collateral circulation is established before inflammation occludes the vessel operated upon, it will collapse and bring that portion of the nose back to its normal condition. In this operation it is best to begin with one milliampere, and gradually increase to two or three milliamperes. In operating upon nevus araneous or spider cancer, we find a large central vessel with numerous radiatory branches that spread out from the central aneurismal loop in a perfect spider web network. By inserting your needle into this central vessel and using about 4 milliamperes of electricity for

two or three minutes the central and radiating vessels become blanched and the operation is completed.

For birthmarks of the venous and arterial varieties, where the vessels are engorged and stretched to the utmost, frequent operations are required. Except in the case of large vessels, connect the needle to the negative pole.

An arterial birthmark that covered one side of the face required weekly treatments for nearly a year before the writer removed it. Yet the improvement is so pronounced after two or three treatments that your patient will continue until a cure is effected. By inserting a single long needle into several vessels at once you will get better results than in using a cluster of needles. A strong current is required for this work. Begin with 4 milliamperes and increase gradually to the point of tolerance. Persistence and perservance in this treatment will remove the worst birthmark extant.

Cutaneous cornus appear on the nose or cheek. They frequently grow from 1 to 1½ inches in length and may be ½ an inch to 1 inch in diameter at the base.

Many methods have been used with more or less success for the eradication of these growths, such for instance, as Pusey's method of removing the horny layer, curetting the base and applying pyrogallic acid upon the site of the cornus. This method leaves a white scar; whereas in recent cases by electrolysis it would be hard to find the former seat of the growth.

By inserting your needle through the base at the point of junction with the skin, and decomposing the cornu with the negative current until it can be lifted away; and then smoothing the base to a level with the skin; a new skin will form, throw off the crust, and in a few weeks look perfectly natural.

About 3 milliamperes will be current enough for the work. There are many other blemishes worthy of notice in this article, but as space is limited it would probably be better to defer taking them up now and use them for another article later. The writer does not believe he is over-enthusiastic on the subject of electrolysis. His experience justifies every statement made and his private opinion of electrolysis is much more emphatic than any written public statement.

Given the skill, the proper instructions, and the experience, and no method compares with electrolysis for such work as is outlined in this article.

Botch your work, use no discretion in the treatment of different cases, go at it in a happy-go-lucky way, and you will get the same results as that kind of surgeon or that kind of dentist gets in his work.

The whole secret of success in electrolysis work, as in all others, lies in doing well all you undertake, and in not undertaking to do a thing until you are positive you can.

Detection of Gall Stones by the X-Ray.

By Mr. W. C. Fuchs, Chicago.

The liver in its continuous movement will almost eliminate the shadows produced by gall stones. A plan was adopted to skiagraph the liver at rest.

The apparatus used is a 10-inch spark induction coil, equipped with a Wehnelt interrupter. The primary coil is wound with four separate layers of wire, the ends of each layer are connected to a switch board and so arranged that one, two, three or four coils can be connected in parallel or in series, the connections to be made suitable for the vacuum of the tube to be used.

Have the patient lie face downward, with the plate beneath. Place the tube directly over the center of the liver. Instruct the patient to keep his breath in deep inspiration while the current is sent through the tube. The patient will give the signal when to switch off the current.

These short-exposed radiographs show the gall stones clearly defined, tho the surrounding parts are not as clear as when more time is given.

I have found by using this plan that a Crookes tube of any degree of vacuum can be used at its highest efficiency when the proper connections are made in the coils composing the primary. The photographic plate was not under-exposed at a 15-seconds' exposure.

An induction coil giving a 12-inch spark can be easily calibrated for a Wehnelt interrupter. Choose a size of wire such that four layers on the primary will fill up the available space between the iron core and secondary tube.

There must be sufficient ampere turns on the first layer to give a secondary spark of four inches; 220 volt service will give best results.

Case 1. B. M., railroad man, 45 years old, native of Illinois, complained of abdominal pain, occasional febrile attacks and loss of appetite. He gave no previous history of colic, jaundice, or gall stones in the stool, and there appeared no other similar definite indications. He was emaciated. A diagnosis of cardialgia, intestinal disease and neuralgia had been made.

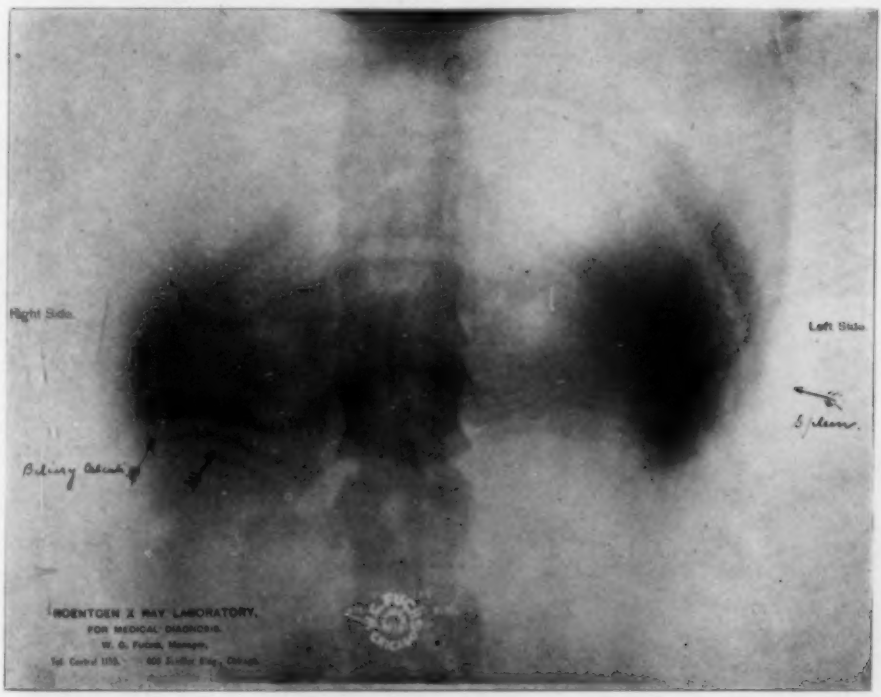
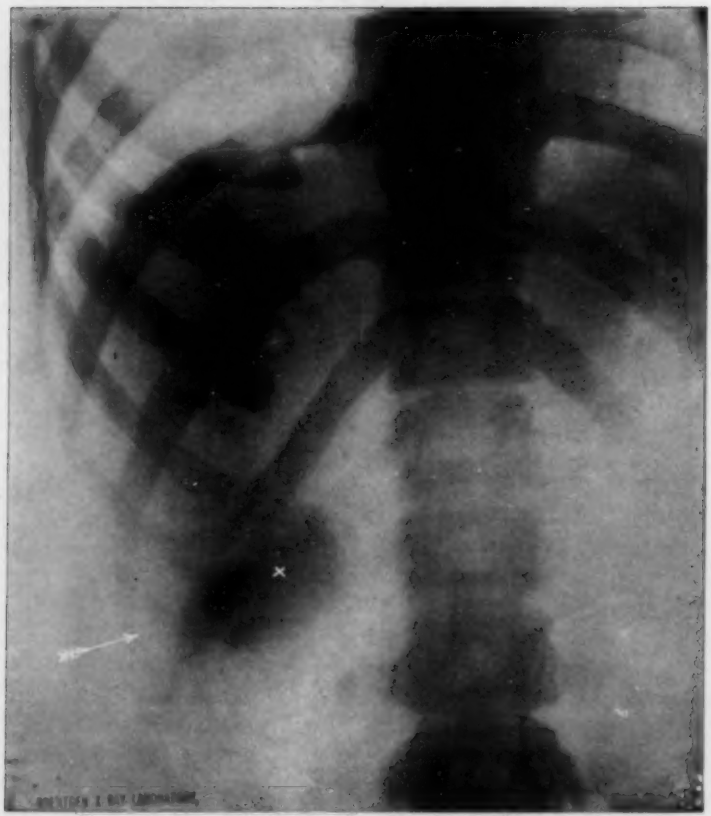


Fig. 1.

The skiagraph, (Fig. 1), shows two gall stones and an enlarged spleen. A successful operation confirmed the radiographic findings.

Case 2. J. B., female, 35 years old,



Cholesterin Stone in the Gall Bladder. Stone removed by operation.

Fig. 2.

Fig. 3.

married, born in Illinois, weighs 140 pounds; appeared for examination with a hard lump in the region of the gall bladder. The usual positive clinical symptoms of gall stone were entirely wanting. Physical examination of the liver yielded negative results, but the gall bladder seemed distended with stones. The friction of the stones upon each other could be heard with the stethoscope. An operation removed 185 stones and recovery ensued.

Case 3. A man 40 years old, who weighed 190 pounds, was without any history of jaundice or digestive disturbances. Short attacks of colic occurred at intervals for some months, followed by an intermission and a return of the paroxisms. The findings of the skiagraph were corroborated by an exploratory operation, which revealed a calculus in a fibrous capsule infiltrated with lime salts.

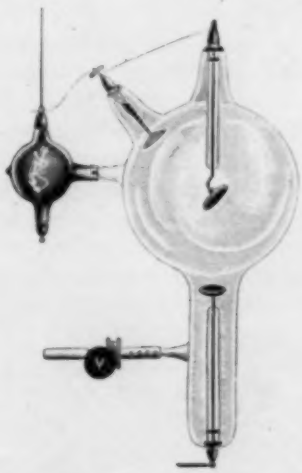
Case 4. A prominent Chicago practitioner, 60 years old, at one time had an attack of colic which the doctor thought was due to gall stones. The skiagraph shows dark shadows in the region of the gall bladder. At the autopsy, three gall stones were found in the viscus.

Fig. 4.

A New X-Ray Tube.

What promises to be one of the best x-ray tubes yet made is known as the Truax-Greene Improved German tube. In appearance this tube slightly resembles the Mueller self-regulating tube, but it is larger. The vacuum is reduced by the direct admission of air through the capillary valve V by simply turning a milled head. It is raised by means of an absorbent substance contained in the small auxiliary bulb, which is connected with the main tube, on the same principle as in a Mueller tube.

The advantages of the Truax-Greene tube are two: First, the vacuum can be raised and lowered rapidly; Secondly, this can be done while the tube is in action without changing any connections. When in use, the anodal con-



nection is made with the wire on the auxiliary bulb. To raise the vacuum, all that is required is to raise the button on the end of the spring which connects this with the main tube, thus forcing the kathode stream in part into the auxiliary bulb, in which the gaseous particles are absorbed.

Without knowing the extent of the experiments which have been performed with this tube it is impossible for us to say what the capacity of the absorbent is, but we presume that it is amply sufficient for the life of the tube.

The Chicago Electro-Medical Society.

This society was organized June 25, 1901, by Drs. A. W. Baer, G. G. Burdick, S. V. Clevenger, Emil H. Grubbe, H. Preston Pratt and Richard H. Street, for investigations in the science of electro-therapeutics. At that date, only a little over a year ago, many of the older regular medical journals refused to publish reports of cases treated by the x-rays or static electricity. Indeed, the great majority of physicians, knowing little or nothing of the subject, were convinced that electro-therapeutics and x-ray therapeutics were mere fads. Today every reputable medical journal invites papers on these subjects, and the change in professional opinion has been brot about largely thru the efforts of the Chicago Electro-Medical Society and similar bodies in other places.

A large number of valuable papers, both theoretical and practical, have been read before the society. But the most valuable feature has been the discussions to which the papers and reports gave rise. Few men do their best work when working alone. The stimulus of other minds, by rivalry, suggestion, criticism, or incredulity, is needed to bring out the best that is in them; and this Journal hopes to see in the near future similar Electro-Medical Societies in all centers large enough to contain half a dozen or more workers in this department.

The officers of the Chicago Electro-Medical Society are the following:

President, Gordon G. Burdick, M.D.

First Vice-President, A. W. Baer, M. D.

Second Vice-President, Emil H. Grubbe, B.S., M.D.

Secretary, T. Proctor Hall, Ph. D., M. D.

Treasurer, Richard H. Street, M.D.

Standing committees are appointed as follows: Membership, Auditing, Publication, Scientific Research, Executive.

Persons outside the medical profession who are interested in the work of the society may be admitted as Associates.

The regular meetings are held monthly, with a vacation during July and August. The next meeting will be held in the Masonic Temple, Tuesday evening, September 30, 1902.

The American X-Ray Journal will report the proceedings of the Chicago Electro-Medical Society, and of all similar organizations which will send us regular reports.

Local Electrotherapeutical and X-Ray Societies exist in several parts and more are being formed. Provision should be made at the next meeting of the Roentgen Ray Society of America, which will be held in Chicago, December 10th and 11th, to include these as branches of the national society. Only by such means can the best work be done and the medical fraternity reap the greatest advantage from their associations.

Resolution to Restrict the Use of X-Rays.

At a recent regular meeting the Chicago Electro-Medical Society unanimously adopted the following resolution:

"Whereas the x-ray is a therapeutic agent of recognized value, and in the hands of ignorant and unskilful persons is liable to do serious injury to anyone exposed thereto, and

"Whereas the professed object of an x-ray operator is exposing a subject to x-rays does not alter the effect of the rays or the dangers incurred, and

"Whereas physicians are the only class of persons recognized by law as having the necessary knowledge and training to justify them in the therapeutic use of dangerous agents,

"Therefore it is the opinion of this society that the Medical Practice Act of the State of Illinois should be so interpreted, or if necessary so amended, as to make it unlawful for any person not a legally qualified medical practitioner to expose to the x-rays, for any purpose whatever, any part of the living human body, for hire or expectation of reward."

The Chicago Electro-Medical Society is undoubtedly right in desiring that only those who have some knowledge of physiology and therapeutics should be permitted to use x-rays upon the human body. Medical societies, in their own interest as well as in the interest of the public, should bring this matter before the various State Legislatures for action.

It is equally important that those who undertake to give x-ray treatment should know all that can be learned about the properties of the x-rays, their use, and the precautions that are necessary to avoid bad results. Information of this kind will be found in the pages of this Journal.

X-Ray Story.

By Dr. Fred S. O'Hara.

CHAPTER III.

Upon my next visit to Dr. Barsto, I found him busily engaged in working an x-ray tube, tho there was no apparent reason why he should do so. During my

various excursions into his consultation room I had gradually acquired the privilege of using the fluoroscope, and now I thot I would take another look at my hand. Tho the color of the tube was apparently the same as I had ofttimes seen, I could not see even a ray of light from my point of observation.

"Doctor, I cannot see the rays," I volunteered. "No more has any man, since the discovery of their existence," was his reply. "The Roentgen rays are invisible, but they possess the property of exciting fluorescence in certain compounds, among these compounds being tungstate of calcium and platino-cyanid of barium. When you place your hand in front of the screen, you see only the fluorescence of the metallic compound coated upon the screen. When you think that you see the bones, it is really that portion of the screen cut off from the rays, and not excited by them. At these places the rays are absorbed by the bony structures, and you see the metallic compound in repose."

"But why cannot I see the same phenomenon, at present?"

"I am curing this tube. It is working in reversal, and by reversing the direction of the current that produces the rays, I am reducing the vacuum of the tube until it will be suitable for practical work once more. If this does not suffice, I shall lay this tube aside for a few weeks and 'rest it.' That is often of great benefit.

"A thoroly rested tube is often better than a new one, as I once had occasion to prove to my friend, Ackerman Olden. But that is another story, and before I settle myself to tell it, I wish to get this tube into condition so that I may use it tomorrow."

Whilst he was working I asked him why it was that I could see light from the tube, tho the rays were invisible.

"That is due to the collision of molecules in the tube. The Crookes tube is a highly exhausted affair, but it is impossible to exhaust all the air from it. That which is left within it is of such slight density that the molecules of oxygen, nitrogen, carbon dioxid, argon, and God only knows what else, are readily pushed and pulled about by the electromotive force. The collision of these molecules is responsible for light in the tube, known as fluorescence. By the color of the tube in action I can tell whether it is of American or foreign manufacture, for in some glass (that in which lead is used), the radiance inside the tube is blue, like the egg of a robin; and in some other varieties of glass the color varies from a light green to a canary yellow. The color is immaterial within certain limits, but a poor tube may give off the color of a good one, whilst being absolutely valueless for working. This is due to thinness of spark or to a fault in the tube itself.

"In producing proper radiance I shall tell you that there are several things to be remembered. It reminds me not a little of giving doses of medicine. We dose the tube with current, as we administer medicine, that is, with reference to certain laws laid down by experience and by experiments.

"Now we will suppose that we are going to radiograph a bullet in situ. A large dose of rays will show the most contrast, and take the shortest time; a small dosage will produce the same result, but with a much longer exposure. Rays of high penetration will produce little or no contrast between bodies of little difference in density, whilst a medium quality of rays will give the best definition and quality of negative. A tube that gives off a great quantity of radiance affects a plate more strongly than does one of fewer rays and greater

strength. But quality of rays, and not quantity, is that which is responsible for good work. However, there is nothing in the whole domain of the use of the Crookes tube (pictorially speaking) that calls for small dosage of rays.

"But I am tiring you. This is not calculated to arouse the interest of any but a physician, and as I have succeeded in getting this tube into shape, we will have a cigar, and a story, for I have an idea that such was the object of your visit."

Settling ourselves comfortably, and contentedly puffing at our perfectos, the Doctor began the tale.

During the spring of '98, I had so much night work that I had almost acquired the art of sleeping during my walks about town. One night after I had made a call as usual, 'long about midnight, I passed the show window of Gorman & Peron, jewellers, on my way to my apartments. I noticed in this window a very large diamond with a very peculiar cutting and a heavy, cumbersome setting. The placard beneath the ring interested me more than aught else for the moment; it read about like this:

'Five Thousand Years Old.'

'This ring was found in the wrappings of a royal mummy recently unearthed from a tomb near the Pyramid of Cheops. The inscription upon the mummy case, when deciphered, gave forth the fact that the eldest princess of the realm, daughter of Ptolemy I., lay therein buried. This diamond is the most marvellous illustration of the work of the ancient Egyptian lapidaries now extant, and is valued at $125,000. It will be upon exhibition for this week only.'

I surveyed the gem more closely on account of this intelligence. What a history was therein concealed! What a tale of the Dynasty of the Ptolemies could it tell if given a tongue wherewith to speak! But that was not getting to bed, so I hastened on.

The more I thought of the gem the greater was my astonishment that it should be left in the window at that hour of the night, for my watch registered the wee small hour of 1 o'clock. I knew that no jeweler would leave such a thing in the window overnight, but by this time a predominant desire to investigate the merits of rest engrossed me, despite the carelessness of jewellers.

The next morning at the breakfast table I opened the morning paper and was astonished to read that the very treasure that I had contemplated last night was stolen. 'Thieves carry away the priceless relic of ancient times. Window cut with a diamond drill and gem extracted through the opening.' Then came an elaboration upon the relic and a vast discourse upon its value, warped and distorted as only reporters can twist things, and finally the statement that by some strange oversight the ring had been left in the window overnight.

I threw aside the paper with the remark, 'There is another nut for Olden to crack, and I was startled by that gentleman himself laying a heavy tho friendly hand upon my shoulder.

'Cut out that breakfast and hustle to your office as fast as a cab can carry you? I will explain later.'

I obeyed the mandate with celerity, and five minutes later was sitting in my office waiting I knew not what. In a very few minutes a well dressed gentleman in evident perturbation stepped into my reception room. I invited him into the private office and he introduced himself as J. Z. Gorman, of Gorman & Peron, jewelers.

Said he: 'I was about to take the train for New York City, to report in person the theft of last night, but at my

breakfast I was seized with a sudden distress and nausea, and I have come here for relief. I assure you it is of the utmost importance that I make the train which leaves in a half hour, so try and straighten me out in time to catch it, for I have to make good the loss they have sustained.' He had grown pale and drops of clammy sweat stood upon his brow.

I placed a large porcelain dressing jar beside him, and soon I had occasion to thank myself for my forethot. My patient's attack of emesis was bidding fair to turn him wrong side out.

I prepared a gastric sedative for him and it was vehemently rejected by the stomach ere it was well settled. I quizzed him at length upon the constituency of his breakfast, and could find nothing that would cause such an irritation of the gastric membranes.

A light rap upon the door called my attention, and I opened it to admit Ackerman Olden.

Ignoring me he said: 'Mr. Gorman, I saw that you were ill at breakfast, and I took the liberty of following you here to see if I could be of assistance to you in a legal way. Such sudden distress is frequently the result of poison.'

'Do not apologize, Mr. Olden. I am glad to see you. Have you learned anything of the case of last night?'

'Not a thing, but it is a little soon for developments. But, say, Doctor, you have been boasting of that wonderful machine of yours, why don't you try with it and see if you can tell what is irritating Mr. Gorman's stomach?'

Ackerman took the key to the case doors. He selected a new tube, and before I was well aware of what was happening, had connected the apparatus, and was surveying the interior of Mr. Gorman. I saw a puzzled look come over Olden's face, and without further ado he handed me the fluoroscope. I simply placed it upon the table, disconnected the tube (after short circuiting the machine by means of a chain and lath, selected a cured tube that had rested for a couple of weeks, connected it up, and removed the lath. The beautiful glow showed me that everything was O. K. and I then handed the fluoroscope to Olden.

A hasty survey sufficed him. A light was breaking upon my brain. I was beginning to see the trend of affairs. I was about to take a look through the mechanism of Mr. Gorman, when Olden waved me aside and said, 'Mr. Gorman, pardon my insolence, but will you allow me to place my hand in your inside vest pocket. But before I take that liberty, I take pleasure in informing you that the Egyptian diamond is located, and will soon be in my hand.' A hasty scuffle, in which Olden's hand sought out the pocket in question, and Gorman sank completely crushed into a chair.

'I'll keep this little package for you, Mr. Gorman,' said Olden; 'you might lose it. The substitute stone that I found this morning was good enough for a beginner to work upon, but you ought not to try to play tricks upon an old jeweler like myself. Come along. I have a cab down stairs,' and Gorman meekly followed Detective Olden from the office. As Olden left the room, he muttered the single word, 'apomorphia.'

There were some few features of this drama from life that were past my comprehension. One of the best known business men of the city, arrested and confessing to a theft! But why the apomorphine? I knew that Olden would explain the matter to me, so I went to the club and finished my morning meal.

That night Mr. Olden honored me with a visit. His opening remark was sufficient to make me joyous. 'Congra-

tulate me, Doctor; I am now Inspector of my district, and I shall smoke better cigars and drink better mineral water in the future.'

I congratulated him with the ardor of long standing friendship.

"But how did you know that Gorman had the diamond?"

"I thought you would be astonished," he replied. "I guess I had better tell you all about it."

I produced a box of perfectos and a cold bottle of mineral water (or something else), and after helping himself to both these delicacies Mr. Olden seated himself in my examining chair, tilted himself away back and began his story.

"I was on the scene bright and early' for the chief had sent for me so soon as the theft was discovered. I went through the safe in order to see that the ring had not been misplaced. Then I went to Gorman's apartments, and his actions showed me that there was big game in the air. One question asked by him put me on to the whole business. 'Did you look down the grating under the window,' said he, and I acknowledged my negligence in that respect. I hustled to the store and after a short search underneath the grating, I found a ring so like the original that had I not known something of diamonds and their cutting, I would have been deceived. There is only one man in this part of the country that could make such an imitation and that is Gorman himself. I remembered having seen him at work a few nights before in the manufacturing department of his store, and I supposed it was some particular job, but it seems that at that time I did not recognize the full importance of it.

He had calculated well. The finding of the substitute stone would hold interest until he could get away and store the real ring in New York, but the dose of apomorphia that I slipped into his coffee before I left him, cut that short.

"But would not the other jewelers in the city detect the change?" I queried.

"How would they get to see it when it was locked up in the safe at the police station awaiting identification from New York? Of course the game would be up when an expert that had seen the jewel before made an examination. But the suspicion of change would have fallen upon a clerk, and not upon the real culprit. You see that it was necessary for me to catch him red-handed, and by means of the x-ray I was successful, for I saw the ring in his pocket (not the diamond), and the rest you know. The inside vest pocket is the most natural place in the world to secret valuables, because it is the hardest of access; and when I saw the outline of metal, shaped like the Ptolemy stone setting, and upon the right hand side of the suspect, I made bold to ask him to shell out."

And so ended the story of the theft of the Egyptian diamond. Gorman was duly punished and Olden became next in line for promotion.

I feel sure that I was never so at sea regarding a case, and in this particular instance he gave me good measure in return for the advice I had lent him from time to time.

Dr. Barsto smiled and relighted his cigar. Our conference was at an end. I bade him good night, and with a hearty handshake he bade me come again and I passed from his office into the night.

There has been a large number of negative results in the attempts made to destroy bacteria in cultures by x-rays. This was to be expected. Under the circumstances, so little being known about x-rays, one set of carefully conducted experiments with positive results is enough to outweigh a hundred with negative results.

EDITORIAL.

ST. LOUIS, MO., 8-9-'02.

To the Managing Editor, American X-Ray Journal.

My Dear Doctor:—

On assuming control of the AMERICAN X-RAY JOURNAL, as owner of the property and managing editor, I desire to congratulate you upon the wholesome and enviable position you occupy before the scientific and professional world. Priority in anything useful to the human race calls forth from mankind the kindest remembrances. But when the fruit of investigation, as in your case, has presented a means for the relief of inoperable and so called incurable diseases, the gratitude of an appreciative people is without measure. He who gives better means for transportation, better clothing, or better food, is in no wise equal as a donor to him who can give health where there was hopeless sorrow.

It is now a matter of history that you were the first to use the x-ray in treating disease. I have the record of your work in treating cancer by x-rays, early in April 1896, and also of your treatment of phthisical patients in the same month. I recall with especial pride your experiments for the purpose of determining the bactericidal effect of the x-rays, begun as early as April 5th, 1896, just four months after the discovery by Professor Roentgen. Certainly no one can claim priority over you, for this work is recorded in the public and medical press of that date. I am glad to note also that the Research Committee of the Chicago Electro-Medical Society in its regular meeting March 25, 1902, recognized your title to this same distinction.

These are some of the reasons which I feel sure place you in a position to take up the work of conducting this publication in accordance with the wishes of the profession. Your unremitting labors will now have opportunity to be better appreciated.

Yours truly,
HEBER ROBARTS, M. D.

Priority in X-Ray Journalism.

In February, 1896, Dr. Heber Robarts of St. Louis, Mo., gave an order to an electrical manufacturing concern in Boston, Mass., to construct for him a x-ray machine from the high frequency type of the Tesla coil. This order was made two months after Professor Roentgen's discovery. The machine was completed and delivered to Dr. Robarts in May. It was the first efficient apparatus made to do practical x-ray work and used west of the Mississippi. The excellent diagnostic work done with this machine, together with a suggestion that the rays had therapeutic properties, encouraged the doctor to obtain the fullest possible information. From medical journals and the public press it was quite difficult to obtain

exact data, and a system of correspondence was likewise unsatisfactory. He therefore decided to establish a journal devoted to the cause, and to invite the enthusiast and all persons interested in the x-ray to give their experience. In April 1897 the matter was prepared for the first issue of the AMERICAN X-RAY JOURNAL.

Its field of usefullness did not seem apparent to many of those that choose to guide the bark of professional hopes, but it had been launched and adverse criticism did not sink it.

The AMERICAN X-RAY JOURNAL is the parent x-ray journal in the world. Every other publication devoted exclusively or partially to the x-ray is an imitation, whether it be monthly, bi-monthly or quarterly. The matter contained in this Journal is a truthful record of the researches throughout the world regarding Roentgen's discovery. Every book published on the x-rays, and worthy of mention, has taken much of its matter from the pages of the AMERICAN X-RAY JOURNAL. This is well seen in two valuable books just from the press, one by Dr. David Walsh of London, Eng., entitled "Roentgen Rays in Medical Work;" the other by Dr. S. H. Monell of New York, entitled "A Pictorial System of Instruction".

At times the AMERICAN X-RAY JOURNAL has been most vigorous in denouncing false doctrine. One instance we will cite is that of the "Inaccuracies of the x-rays," so called by men influential in medical circles. These same persons, without any technical knowledge of x-ray uses affected great learning and wrote misleading articles, mere rot, that had to be put down at once to save this science for the practitioner. Another instance was seen in the effort made to treat the great discovery as a joke. A professor of surgery and dean of a medical college, we are told, in a lecture likened the x-ray to the kodak. Efforts were made to shelve it by according it a place with the electrical faker. The AMERICAN X-RAY JOURNAL promptly drove these fallacies into oblivion. The light that followed this courageous course has made America foremost in the successful use of the rays.

The truth having been established that an x-ray apparatus is the most important implement of the doctor's armamentarium, that the AMERICAN X-RAY JOURNAL is living history and must be in the hands of every up-to-date doctor, that the therapy of the x-ray as predicted in 1896 has been fully realized, and in fact all the prophecies made by Dr. Roborts in the Announcement of the first Journal have been fulfilled; he has willingly accepted a well earned rest.

We quote from Dr. Robarts' Announcement written in April 1897. "The conduct of this journal will not be arrogant, defiant or bigoted, but it will will have the courage of con-

viction to push forward the truth as we understand the truth. It will be ethical, as the throbbings of every breast should be, regardless of any written code devised by man for another's guide. There will be no personal venom, as we hold no animus against any man, but false principals will be attacked with the vigor of our ability. This is a pioneer journal of x-ray work. We are not imitators. We are casting our hopes among the needs and wants of man. We expect encouragement.

"While it can not be expected nor desired that we shall escape just criticism, and it may be constumely, yet our aim shall be to improve each coming journal, encouraged as we are with the faith and usefulness of our mission."

In common with a very large number of x-ray workers we desire to express our high appreciation of Dr. Robarts' pioneer work. The medical profession owes him a deep debt of gratitude for his unselfishness and unswerving honesty of purpose, which, as Dr. Pitkin aptly says, "Have been so largely instrumental in making this light shine forth in all its glory for the healing of the nations."

The new management is heir to a journal of stainless reputation and genuine worth. Its aim will be by adherence to the highest ideals and by legitimate business energy to make the AMERICAN X-RAY JOURNAL the best of its kind in the world.

T. PROCTOR HALL,
EDITOR.

Destruction of Bacteria by X-Rays.

H. Rieder reports in Muenchener Medicinische Wochenschrift, March, 1902, a continuation of experiments begun by him in 1898 relative to this subject. The bactericidal power of the Roentgen rays was tested against the cholera spirillum, the bacillus prodigiosus and the colon bacillus. The micro-organisms were inoculated into gelatine or agar and exposed to the action of the rays in Petri dishes, the covers being removed. After twenty to thirty minutes' continuous exposure to the rays many of the bacteria were killed, and multiplication ceased in nearly all. In every series of experiments, however, a few of the individual bacteria were not affected. Experiments have shown that the bactericidal power of the rays is not due to the fluorescent light, heat, ozone or electricity. So far as is known the culture medium is not altered by the rays or made unsuitable for the growth of bacteria. Gelatine is never liquefied. It is not, however, to be assumed on the basis of the above experiments that the Reontgen rays possess any bactericidal action upon bacteria when present in the animal body. The evidence from animal experimentation is against such a supposition. As a rule, animals inoculated with pathogenic bacteria and exposed to the rays die sooner than similarly inoculated animals which are not thus exposed. It is not to be denied that in the human subject certain infectious diseases, particularly those of the skin, may be successfully treated by the Reontgen rays, but it does not seem probable, at the present time, that such success is due to bactericidal action.—Medical Record.

Editorial Notes.

Thirty years ago we spelled labor "labour" as our English friends do still; wagon we wrote "waggon," gulf "gulph," etc. Five years ago we wrote "iodine, morphine, sulphur," etc., for iodin, morphin, sulfur.

It is very annoying to have to learn to spell all over again, but we are obliged to follow the standard authorities in matters of this kind; and where the changes are clearly an improvement we follow willingly. When the American Philological Association advises us to drop the ugh from "though" we say "U'gh! Why, certainly," and adopt some other similar simplifications. Life is too short for such spellings as "though," "through" and "thought." Before many years we will all be sufficiently "progressiv" to write "ar," "giv," "hav," etc., and then wonder why we followed the old plan so long.

Electricity is not a cure-all. It is a form of energy which can be advantageously used to cure disease, differing not at all in this respect from heat, light and other physical agents.

In treating a patient with x-rays it is important to use a tube of such degree of vacuum that the rays reach into, and just thru, the part of the body to be treated. It is the rays that stop in the tissues that do therapeutic work. Rays that do not get there, and rays that go clear thru, do nothing.

Dr. A. D. Rockwell, author of a well known work on electrotherapeutics, says in the Medical Critic for June: "I am quite free to admit that psychical influences play an important part in electrotherapeutics, as it does in all forms of treatment. It may be even true, as Moebius states, that four-fifths of all cures ascribed to electricity are due to psychical rather than to physical influences, and, admitting that even nine-tenths of the cures are psychical—this fact would be no bar to its use nor militate against its actual value."

The doctor overlooks the fact that psychic effects are brought about thru physical agents. The psychic effects of electricity are just as definite, and just as valuable, as the chemical or physical effects. This Journal will publish a paper on the psychic effects of electricity in a later number.

In the same number of the Critic, discussing the Electrolytic Treatment of Subcutaneous Nevi, Dr. Rockwell says: "There is so much that is capricious and uncertain in electrical treatment, both medical and surgical, that it is a satisfaction to be able to turn to morbid conditions where the action of electricity is governed by unalterable fixed laws, and where its effects are specific and certain."

The Editor has often wondered why none of the text-books on electrotherapeutics give a clear statement of the principles of the science. The answer in this case is evident from our quotation. Dr. Rockwell has done excellent work in the early days of electrotherapy, and is justly honored for the work he has done. But apparently he is now resting on his oars, leaving the work to younger men who are equipped with all that modern physical and biological science can offer them, and to whom an apparent capriciousness is only a stimulus to further investigation.

The science of electrotherapeutics is not in the nebulous condition that Dr. Rockwell's remarks seem to imply.

As regards the destruction of bacilli in the body, the microscopic investigation has shown (1) the presence of tubercular bacilli in the skin in a case of lupus, and (2) the absence of the bacilli in the same region after a series of x-ray exposures. The x-rays are therefore, directly or indirectly, destructive to bacteria within the living tissues.

A case of melano-sarcoma of the lymph glands, treated by x-rays, was reported by Dr. A. E. Sterne at the Marion County Medical Society, Indiana, last April. Under treatment the masses diminished greatly, and some disappeared. But the patient grew worse, and seemed to be overcome by toxemia.

Without expressing any opinion as to this particular case, it is a fact that in the treatment of malignant or extensively diseased areas by x-rays particular attention must be paid to avenues of elimenation, in order to rid the system of poisons which are thrown into the general circulation by the action of the rays.

The Eclectic Medical Journal is publishing a series of papers by Dr. J. R. Spencer, of Cleveland, O., on Electro-Therapeutics. In the July number he deals with electro-physiology, as taught in the well known texts on that subject.

Dr. E. T. Reed writes in the Medical Brief for March an explanation of the law of sex production, as follows: "We have produced by the action of the sun and moon upon the earth, world-wide semi-diurnal electric currents; six hours positive and six hours negative, corresponding to the flow and ebb of the tides on the oceans, which may better be termed action and reaction—the great heartbeat of the universe. Salt water being strongly magnetic, we have a visible demonstration of this law on the great seas, but the effect of the law is everywhere present, and is manifest in all organic and inorganic life:

"Now, conception taking place in the positive hours, will be positive in its nature, and as a rule a male, but occurring in the negative hours, will be negative, and as a rule a female."

Only a wider knowledge of electricity among physicians, and especially a little more discrimination on the part of the editors of medical journals, will prevent the publication of such nonsense as the above. Earth-currents are not "six hours positive and six hours negative." Salt water is not "strongly magnetic." And even if both these statements had been true they would not explain sex-production.

Kienbock, of Vienna, cautions physicians that severe burns and ulcers are caused alone by over-exposure, and that the operator can no longer shield himself behind a supposed idiosyncrasy of the patient. This potent agent should only be used by those who have become thoroly expert with it, especially by studying its underlying principles and by experimenting on animals. The effects are in direct proportion to the strength or activity of the rays, and these qualities depend on various factors which must be fully understood by the operator.

The x-ray is evidently a giant in chains; he must be careful who unchains it.—The Philadelphia Medical Journal.

Hildebrand has for four years employed the Rontgen rays in various forms of internal disease for the purpose of forming some estimate of their value. He believes that they are practically useless in the recognition of the

early forms of tuberculosis, partly because these forms do not give a sufficiently distinct shadow; partly because they occur at the apex where the osseous structures are concentrated, and interfere with an accurate valuation of the pulmonary condition. In advanced cases, however, it is sometimes possible to recognize that the disease is more extensive than the physical signs apparently indicate. In cases of pulmonary gangrene, however, they are of the greatest value, and he reports three cases, in two of which Roentgen rays indicated the site of operation, and both of which recovered, and in the third the examination showed multiple foci, and an operation was therefore not performed. He also mentions a case in which pneumothorax was correctly recognized and appeared to be recurrent and without any satisfactory cause.—Muenchener Medinische Wochenschrift.

Loss of Life in the United States by Lightning.

Mr. Alfred J. Henry, Professor of Meteorology of the Weather Bureau, United States Department of Agriculture, has published a bulletin relating to the above subject.

The number of persons killed by lightning during 1900 was 713; of this number 291 persons were killed in the open, 158 in houses, 57 under trees, and 56 in barns. The circumstances attending the death of the remaining 151 are not known. Nine hundred and seventy-three persons were more or less injured by lightning during the year.

The following rules are laid down with regard to an individual struck by lightning: (1) Make the subject breathe by artificially imitating the respiratory movements of the chest; (2) Keep the body warm; (3) Send for a physician; and, in conclusion, it is noted that lightning frequently causes a temporary paralysis of the respiration and heartbeat, which, if left alone, will deepen into death, but if intelligently treated, will generally result in recovery.—Medical Record.

Glass versus Mica Plates.

In the June number of this Journal Dr. Henry S. Waite challenged the makers of mica plate static machines to a test of their merits. R. V. Wagner & Co., in our July issue, accepted the challenge on conditions which seem to be fair from a manufacturer's point of view. This is a question of more than personal interest. Everyone who uses or expects to use a static machine is interested in the result of the trial. We hope that nothing will interfere to prevent satisfactory arrangements for the contest, and that the gentlemen chosen as judges will be men who are well known for their knowledge of electricity and their experience in static and x-ray work.

We suggest that in addition to the machines selected for trial; namely, the worst that can be found by the opponent in each case under R. V. Wagner & Co.'s conditions; each contestant be asked to furnish the best machine he is able to produce. This would greatly increase the scientific value of the trial, and would make it also more equitable from every point of view.

It would be advisable also to make the contest semi-public; admitting, under reasonable limitations, any who are sufficiently interested to desire to see the tests made. The coming meeting of the Roentgen Ray Society in December would be a suitable occasion.

Carcinoma and the Rontgen rays.

G. B. Ferguson in the British Medical Journal, February 1, 1902, reports a case of recurrent carcinoma occurring on the sternum of a woman. It was the size of a hen's egg, and three surgeons had deemed operation inadvisable. The Roentgen rays were tried as a last resort. The exposure was for 20 minutes for as many days. The patient left for a month, and when she returned the tumor had disappeared. He believes there is a great future for this method of treating carcinoma.—American Medicine.

The Nashville Journal of Medicine and Surgery, reporting a paper by Dr. J. Elwood Stubbert, of Liberty, says: The fluoroscope and the Roentgen rays enables one to ascertain with a considerable degree of accuracy the position and relation of the areas of consolidation of lung tissue. In about 50 per cent of the cases the right apex is not quite so clear as the left. A slight shadow is cast by the deltoid muscle. Where there is only a very slight infiltration, the Roentgen rays reveal a haziness around the clavicle or at its edges.

The conclusions arrived at by Alfred Cooper, F.R.C.S., and expressed in The Lancet, October 12th, with regard to the remedies recommended in the treatment of inoperable cancer are in part as follows:

That in cases of inoperable rodent ulcer, and in the superficial malignant ulceration in other parts, the Roentgen rays give a good hope of improvement. —St. Louis Medical Review.

The Brooklyn Medical Journal for February published a paper by Dr. John A. Lee, entitled "The Therapeutics of the X-Rays," in which he refers to some cases of lupus and other skin diseases treated by x-rays. One case which was treated and cured in 1899, recurred in 1900; when it was again cured after only six exposures, and has remained well ever since. He emphasizes his statement that "it is unnecessary to cause dermatitis," in treating lupus. He erroneously credits the first x-ray treatment of lupus to Schiff, and the first in the United States to Jones, of San Francisco. The first case of lupus in the world to be treated by x-rays was treated by Dr. H. P. Pratt, of Chicago, in June, 1896, referred to him for treatment by Dr. John B. Murphy.

C. Beck distinguishes three different degrees of burns from the x-ray: The first degree being characterized by the symptoms of hyperemia, the cutis being infiltrated and the temperature somewhat higher. In the second degree there is the formation of blisters, the clear yellowish contents of which lift the corneous from the mucous stratum of the rete Malpighii. The third and gravest degree is characterized by the escharotic destruction of the irradiated tissues. The most characteristic difference between ordinary burns and the integumental changes produced by the Roentgen light is the fact that the latter do not manifest themselves before the lapse of a period of incubation, as a rule, about two weeks. At first there is a light, later dark, redness, and, finally, the skin becomes brown and scaled. After a few weeks there is complete recovery. Sometimes slight pigmentation of the integumen remains. In one of the author's cases of lupus treated in this way it was necessary to irradiate fifteen times before reaction occurred. It was not until the twentieth exposure that the redness decreased and some of the nodules began to shrink. After the

twenty-fifth exposure the ulcerations had disappeared and no nodules were found. The redness still persisted for six weeks.—The New York Medical Journal.

William J. Morton concludes an article on radiotherapy for cancer and other diseases as follows: (1) Radiotherapy broadens our conception of the possibilities of the therapeutics of modern medical science. (2) The x-ray has a general application for the relief of pain. (3) As to technique, a standardization as to the apparatus and its capacity, as to duration and frequency of treatments and distance of the tube, is recommended to operators. (4) The x-ray has a curative effect in internal cancer and other internal diseases. (5) For superficial disease a medium soft tube may be used, for internal cases a hard tube. The hard tube is applicable, however, in all cases. (6) X-radiation is recommended prior to any operation, to clear the tissue of cancer particles and foci, and to circumscribe the disease. (7) X-radiation is recommended after operation to preclude a recurrence. (8) X-radiation may be recommended in place of an operation, and may be preferable to one for the reason that operation secures but a comparatively moderate percentage of permanent recoveries, and because up-to-date x-ray procedure shows a continued improvement in cases, and a percentage of cures which will, undoubtedly, compare favorably with surgical operation. (9) There is danger to the patient or uncertainty as to what might be accomplished when the x-ray is employed by immature operators. (10) In x-radiation we possess more nearly a solution of the problem of curing cancer than by any other method of treatment. —Medical Record

A new Esophagoscope, for inspecting the stomach and esophagus, was described by Dr. Max Einhorn in the Medical Record for January. It consists of a straight tube with a small "cold electric lamp" at the lower end, and an obturator which is removed as soon as the tube is in position.

CLINICAL.

CARACAS, VENEZUELA, S. A.,
June the 30th, 1902.

To the Editor, American X-Ray Journal.

A patient, a lady 48 years of age, was almost dying when a *New York Herald* came into my hands, in which was an article on the marvelous effects produced by the x-rays in carcinomas. As the case was diagnosed by some physicians as carcinoma of the anterior wall of the stomach, an application was made to that region, using a pear-shaped tube of old construction, which was all we could get here, exited by an Edison 6-inch spark coil, with Laumer interrupter.

The effect of the rays was simply marvelous. The vomiting, pain and tumor disappeared after eight applications.

It is impossible to find a more severe case than the one I speak of. The patient vomited everything including water, even by drops, in spite of chloroform water, cocain, menthol, condurango bark, ice locally and internally applied, etc., etc.

Now the question arises, was it a case of carcinoma? I believe not. The previous history of long standing diarrhoea and slight fever, the progressive emaciation, speaks in favor of infllammation of the peritoneum, localized over said region, probably of tubercular nature, so much so, that the patient, although free from tumor of the epigastric region, and having improved a great deal, still continues with diarrhoea and slight fever.

The applications numbered 22 in all, and were made six months ago.

The tumor extended over the region of the epigastrum, reaching the region of the liver; was hard and painful, and pulsated with every beat of the aorta.

The skin of the epigastric region became dark with the application of the rays, but no burns of any kind occurred; they lasted

ten minutes at a time, and the tube was not placed over two inches from the surface; it was a very soft tube.

DR. BELLOSQUERAS,
(University of Pennsylvania, 1878.)

Roentgen Ray Society of America.

The next meeting of the Roentgen Ray Society of America will be held in Chicago, December 10th and 11th, and promises to be the best meeting in the history of the Society. A very fine program, which will be announced later, has been secured, and on it are several of the leading men of Medicine and Science. We will have a manufacturers' exhibit, showing the latest improvements and most approved forms of apparatus. The local preparations are in the hands of a most excellent Committee, as follows:

DR. RALPH R. CAMPBELL, *Chairman.*
414 Marquette Bldg., Chicago.

DR. JOHN B. MURPHY,
Reliance Bldg., Chicago.

DR. LOUIS E. SCHMIDT,
424 North State Street Chicago.

DR. M. L. HARRIS,
100 State Street, Chicago.

DR. W. L. BAUM,
103 State Street, Chicago.

DR. H. G. ANTHONY,
465 Dearborn Ave., Chicago.

DR. W. A. PUSEY,
Columbus Memorial Bldg., Chicago.

For any particulars or information, write to either the Executive Committee or the Committee on Arrangements.

WESTON A. PRICE, D. D. S.
Chr. Ex. Com.

The Chairman of the Local Committee informs us that the meeting will be held at the Sherman House.

Dr. James P. Marsh, member of the Executive Committee, writes that the program will be beyond criticism. Only papers of the highest grade will be accepted, and the meetings will undoubtedly be of very great interest from both scientific and practical standpoints.

The American Electro-Therapeutic Association.

The Twelth Annual Meeting of the American Electro-Therepeutical Association will be held September 2d, 3d and 4th, 1902, at Hotel Kaaterskill, Catskill Mountains, N. Y. Following is the preliminary program:

9 o'clock p. m. at the Kaaterskill Hotel, Executive Council Meeting.

September 2d, Tuesday, 1st day.
8 o'clock a. m.—Breakfast.
9 " " —Executive Meeting.
10 " " —Scientific Sessions.
1 " p. m.—Dinner.
2 " " —Excursion per Mountain Wagons.
4 " " —Afternoon Session.
9.30 " " —Parlor Entertainment and Concert.

September 3d, Wednesday, 2d day.
8 o'clock a. m.—Breakfast.
9 " " —Morning Session.
1 " p. m.—Dinner.
2 " " —Afternoon Session.
7 " " —Banquet.
9 " " —Hop.

September 4th, Thursday, 3d day.
8 o'clock a. m.—Breakfast.
9 " " —Morning Session.
1 o'clock p. m.—Dinner.

Special hotel and railway rates are arranged. For particulars write to the Chairman of the Executive Council, Dr. Robert Newman, 101 West 80th Street, New York.

Every physician who is interested in electro-therapy, will find it greatly to his advantage to be present.

Improve Your Wehnelt.

My old Wehnelt gave me very much trouble on account of the sediment being stirred up during use.

Each time I used the Wehnelt a fine sediment clouded the solution which would settle at the bottom of the jar. Next time the interrupter was used, this sediment become stirred up, and finally became sufficient in quantity to interfere with the action of the interrupter, and the solution had to be filtered.

I became tired of filtering and purchased a specimen jar eighteen inches high and seven inches in diameter. The sediment settles so far from the electrodes in this jar that it is not disturbed during use, so I always have a clear solution without filtering.

J. P. HETHERINGTON, M. D.
417 Fourth Street,
Logansport, Indiana.

Special Notice.

We are in receipt of numerous enquiries asking us to recommend physicians in various parts who are competent to use electricity and the x-ray.

We propose to reserve space in our advertising pages for cards of those we know to be competent. For conditions and terms address the publishers.

Queries Answered.

VALDOSTA, GA., JULY 25th, 1902.

MR. EDITOR:—

When I use the x-ray tube I begin thus: First, see if my machine is charged, if so, I then push the prime conductors close together, make them touch, then connect tube to machine and start machine to moving very fast; about the time I get it to moving 250 or 300 revolutions per minute, I begin to pull the sliding rods or prime conductors slowly apart until the tube lights up, then let the sliding rods remain there; as a rule the tube lights up by the time the rods are two or three inches apart. I let the rods remain in that position and run my machine with tube lighted up, sometimes one-half or three-fourths hour at a time.

Is the above description the correct way to light up a tube?

I have three cases of cancer that I am going to begin treatment on in about two weeks; I have a Truax German tube and another tube I bought from Truax. Is either one of them suitable for such work, if not, advise me what to buy.

Yours truly,
M. Y. ALLEN.

You run the risk of having your machine change its polarity as you are drawing out the sliding rods. It is safer to pull the rods wide apart after determining the polarity, stop the machine, connect your tube, and then start the machine. It is not necessary to run the machine so fast.

Any tube that gives a good supply of x-rays will do to treat cancer if your vacuum is right. Keep the vacuum so high that the rays pass through the cancer, but no higher. Six to twelve inches is the usual distance of the tube from the body.

PHARMACY TAUGHT BY MAIL.

It is not necessary to go to a college to take up Pharmacy. We can teach you by mail. Our system is distinctive There is no other like it. Over two hundred graduates during the past year to testify to the excellence of our methods. We give you exactly the same instruction that you would get from a college, and save you a great deal of money and valuable time.

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